A Remark on the Planarity of the Shuffle-Exchange Network of Sizes 16 and 32

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The shuffle-exchange network involves shuffle and even-odd pair connections, and hence omits some of the ('odd-even') connections that are present in a full ultracomputer. This note demonstrates that a 16 processor network of this sort can be imbedded in the plane without crossings (Figure 1). In addition, we show that if just 6 connections are allowed to pass through the 'active' area occupied by another processor then the 32 processor case is also planar (Figure 2). Connections of this sort may be feasible in a VLSI technology.

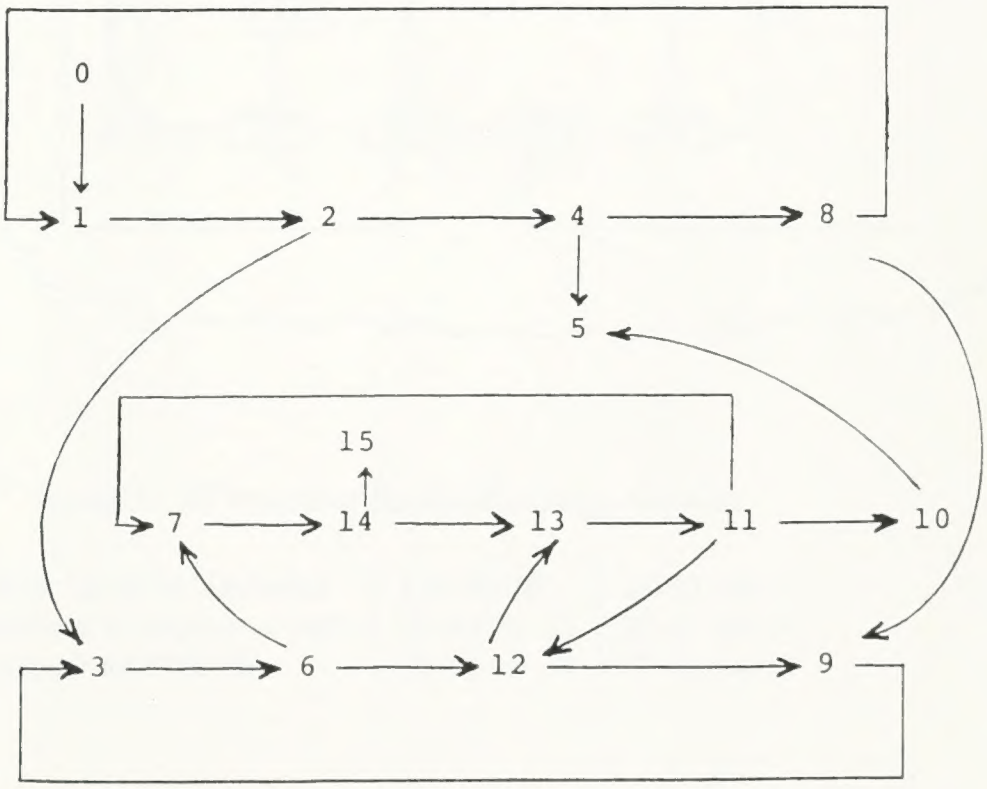

Figure 1. 16 Processor Shuffle-Exchange Network

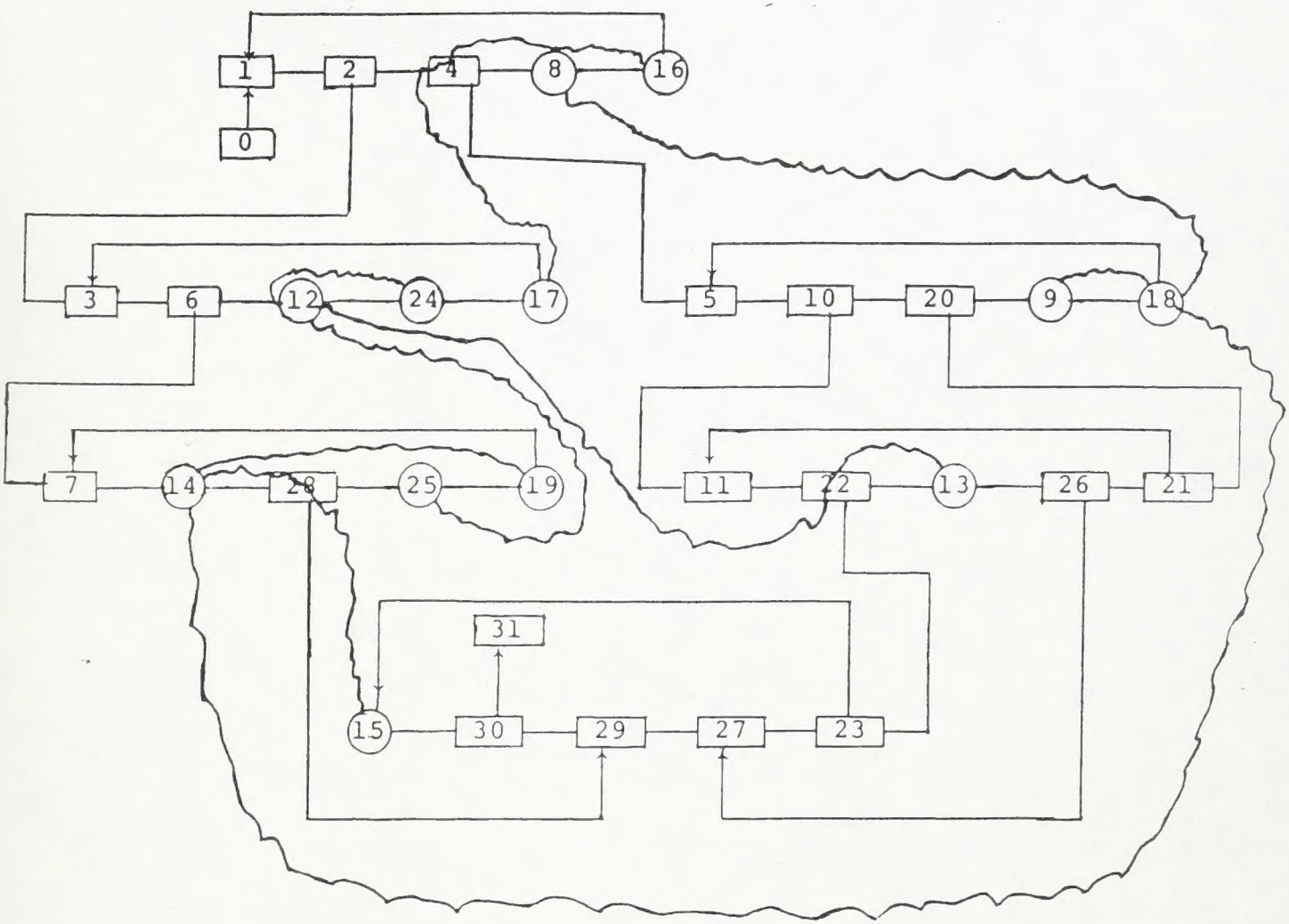

Figure 2. 32 Processor Shuffle-Exchange Network

In six cases the exchange connection requires a path through another PE:	8→9 via 18	16→17 via 4
	12→13 via 22	18→19 via 14
	14→15 via 28	24→25 via 12